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SHORT COMMUNICATION

Rotational Grazing Pasture Management System in Sheep in Tamil Nadu to Gain Better Bodyweight through the Control of Nematodes

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ABSTRACT

A model rotational grazing pasture for sheep at Instructional Livestock Farm Complex, Madhavaram, Tamil Nadu Veterinary and Animal Science University (TANUVAS), Chennai was established in 2015 to study the performance of sheep grazed in the rotational pasture. An area of 1,00,000 sq. ft was divided into 10 paddocks i.e. 9 for rotational grazing and 1 for control. 13 numbers of sheep allowed for grazing for 7 days in each paddock on rotational system. In control paddock, 13 numbers of sheep allowed for grazing continuously for 6 months. 16.89% of more weight gain was observed in sheep grazed in rotational paddock than that of control paddock. Average nematode egg count in dung samples which were collected from sheep grazed in rotational paddock was lesser than that of sheep grazed in control paddock. Rotational grazing of sheep has definitely impact on controlling parasitic load in sheep as well as on pasture by interfering the life cycle of parasite.

Keywords: Body weight, Paddock, Parasite, Rotational grazing, Sheep

Rotational grazing has an accepted role in the management of gastronematodosis of small ruminants in humid tropical regions (Colvin *et al*., 2008). Sheep are noted for their ability to utilize the pasture /grazing resources in our country and contribute significantly to the poor marginal and landless farmers in our country. The total sheep population in India was 65.06 millions in 2012 (19th Livestock census, 2014). The productivity of our sheep is very low when compared to those from developed countries. One of the main reason for the low productivity of sheep is poor feed and fodder resources.

The sheep in Tamil Nadu are raised by farmers by grazing in common community lands. The availability of forage in this land is not uniform which reflects hardly on the performance of sheep. One of the tested practices to improve sheep performance is to go for pasture improvement and rotational grazing. Rotational grazing is the practice of moving grazing animals between pastures on a regular basis. As such, no cultivated pasture is available in our state.

For the first time in India, a model rotational grazing pasture for sheep was established at Instructional Livestock Farm complex, TANUVAS, Madhavaram to study the effect of rotational grazing management on control of gastrointestinal nematodiasis in sheep.

The total area was divided into 10 paddocks (each paddock consist of 10,000 sq. ft. area) and 9 paddocks were utilised as rotational paddocks and rest of one paddock was used as control paddock. Partition was made and all 10 paddocks were properly fenced. Each paddock was provided with

Table 1: Nutritional status of biomass in a paddock (%)

Name of sample	Moisture	Crude Protein	Crude Fibre	Ether Extract	Total Ash	NFE
Random sample of mixed fodder	80.03	13.64	26.54	3.54	9.95	46.33

Table 2: Comparison of Mean body weight of sheep in control and rotational paddocks at fortnight intervals (kg)

Fortnight interval	1 st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th
Control	10.98	11.56	11.85	12.65	14.26	14.55	15.25	16.17	17.92	17.98	17.98	17.95	18.02	18.12
Rotational	10.95	11.40	11.88	12.24	14.01	14.09	14.94	16.04	17.43	17.64	17.84	18.42	19.10	19.30

a gate. 2 rain guns were used for irrigation of paddock. Desmanthus, Stylo, Guinea grass were allowed to grow in all paddocks. They provided 1100 kg biomass at any given time to a sheep. Proximate analysis of fodder grown in paddock were analysed as per Association of Officials Analytical Chemists (A.O.A.C., 2000).

26 numbers of Non-Descriptive female sheep aged between 4 and 5 months were purchased and they were divided into two groups (one group of 13 animals for control paddock and the other for rotational paddock). Number of days of grazing on each rotational paddock was 7 days. Rest period between grazing in a rotational paddock was 56 days. In control paddock sheep were continuously allowed for grazing without any rotation. Body weight of sheep of both control and treatment groups were recorded once in fortnight for six months. Dung samples from sheep of both groups were collected once in a month for 6 months and examined for the presence of nematode egg count by McMaster egg counting technique (Soulsby, 2005). Random pasture samples were collected from both treatment and control paddock and larval burden of random samples from were calculated by Modified Baermann's method. Results were statistically analysed using 't' test. Economics of growing sheep in the rotational pasture was also calculated. Nutritional status of biomass of a paddock is given in Table 1. Sheep grazed in rotational paddock gained more body weight than sheep grazed in control paddock. Mean body weight gain of sheep in control paddock and in rotational paddock was 7.146+0.31423 kg and 8.353+0.369 kg respectively (Table 2). 16.89% of more weight gain was observed in sheep grazed in rotational paddock than that of control paddock.

In 'T' test, significance (P value was 0.058) was observed at 94.2% level. Though the difference is statistically not significant, an apparent significance was observed between weight gains of both groups. Average nematode egg count in dung samples collected from sheep grazed in rotational paddock was lesser than that of sheep grazed in control paddock (Table 3). But the difference was not statistically significant ($P > 0.05$ in Independent T test). 48.1% of reduced larvae was noticed in random sample of pasture in rotational paddock compared to that of control paddock. Profit of income was shown in Table 4.

Table 4: Economics of sheep in Rotational Grazing

Expenditure

Sl. No.	Items	Cost (₹)
(A) Non – Recurring		
1	Cost of partitioning	1,21,320
2	Cost of Fodder cultivation	38,600
	Total	1,59,920
(B) Recurring		
1	Cost of 26 Sheep @ ₹ 2500/lamb	65000
2	Miscellaneous (Vaccines and Medicine)	5000
	Total	70000
	Total (A+B)	2,29,920

Income: Sale of 26 live sheep @ ₹ 200/kg = 26X 200x19 = ₹ 98,800 (Average Live weight was 19 kg . Cost: ₹ 200/kg)

Result: Profit: (Income – Recurring expenditure) 98,800 – 70,000 = 28,800

Rotational grazing is a grazing management strategy characterized by periodical movement of livestock to fresh paddocks to allow pastures time to regrow before they are

grazed again (Beetz and Rinehart, 2010). 16.89% of more weight gain was observed in sheep grazed in rotational paddock than that of control paddock. Results of this study concurred with findings of Boswell *et al*. (2012) who stated that rotationally grazed ewes maintained body weight better than continuously grazed animals. Observations from arid areas such as South Africa, Australia have also demonstrated the superiority of rotational grazing over continuous grazing where stocking rate is high (Shrrow and Krueger, 1979). We used 13 numbers of sheep in a group in this study, herd of 100s of sheep could be tried to grow in rotational paddock to achieve more body weight. Nematode load was found to be lesser in rotational paddocks than control paddock. Eysker *et al*. (2011) also demonstrated that rotational grazing for periods of one week on six plots prevented the build-up of heavy lungworm infections. Rest period between grazing in rotational paddock in our study was 56 days. As Colvin *et al.* (2008) suggested intensive rotational grazing system with short grazing periods and long rest periods between grazing can assist with control of gastrointestinal nematodiasis and give significant results. Rotational grazing of sheep has definitely impact on controlling parasitic load in sheep as well as on pasture by interfering the life cycle of parasite. More research is required to study the biomass availability in each paddock consumed by sheep, nutrient content of each fodder grown, natural grass available and also the carrying capacity of each rotational paddock. Moreover rotational grazing is more economical if the farmer owns a land.

SUMMARY

A model rotational grazing pasture for sheep at Instructional Livestock Farm Complex, Madhavaram, TANUVAS, Chennai was established in 2015 to study the effect of rotational grazing on control of nematodes in sheep. 16.89% of more weight gain was observed in sheep grazed in rotational paddock than that of control paddock. Average nematode egg count in dung samples which were collected from sheep grazed in rotational paddock was lesser than that of sheep grazed in control paddock.

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